



Process and Device for Cracking of Hydrocarbons Using Two Successive Reaction Chambers

The present invention concerns the cracking of hydrocarbons in the presence of cooling particles, either catalytic or not, circulating in the fluidized phase. Another particular object of the present invention is a process for cracking hydrocarbons in a fluidized bed wherein the cooling particles circulate in two successive reaction chambers, in each of which they are put in contact with one or several cuts of hydrocarbons to be cracked.

The present invention furthermore relates to a device designed for the process in accordance with this present invention.

As known from prior art, the petroleum industry uses processes for the conversion of heavy hydrocarbon charges wherein the hydrocarbon molecules with a high molecular weight and with a high boiling point are split up into smaller molecules that are capable of boiling at lower temperature ranges, depending on the desired application.

To effect this type of conversion, the petroleum industry uses, in particular, so-called fluid-state cracking processes. In these types of processes, the hydrocarbon charges, in generally pulverized in the form of small droplets, is put in contact with cooling particles at high temperature and which circulate in the reactor in the form of a fluidized bed, i.e., in a more or less dense suspension within a gaseous fluid which ensures or assists in its transport. In contact with the hot particles, the charge vaporizes, and the hydrocarbon molecules are cracked. The cracking reaction is a thermal reaction in case the particles only have a cooling function. The cracking reaction is catalytic by nature in case the cooling particles also have a catalytic function, i.e., they represent active sites promoting the cracking reaction, as is the case, in particular, in the so-called fluid-state catalytic cracking process (commonly referred to as FCC process, based on the English "Fluid Catalytic Cracking").

After reaching, upon completion of the cracking reactions, the desired range of molecular weight combined with a corresponding reduction of the boiling point, the reaction effluents are separated from the particles. The latter, deactivated under the influence of the coke which has deposited on their surface, are generally stripped in order

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